Epidemiology Report

NORTH DAKOTA DEPARTMENT of HEALTH

March – April 2004

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2004 West Nile Virus Surveillance

West Nile virus (WNV) was first reported in North Dakota in July 2002. Over the past two years, the North Dakota Department of Health (NDDoH) – in conjunction with several local, state, federal and private agencies – has conducted WNV surveillance activities and has provided WNV prevention materials and messages. Surveillance activities include reporting and testing horses and live and dead birds, in addition to trapping and testing mosquitoes for WNV infection. Monitoring human illnesses also will be conducted this summer. The Veterinary Diagnostic Laboratory at North Dakota State University will conduct testing of live bird serum, dead birds and horses for WNV.

Health-care providers are requested to report diagnosed WNV cases and submit samples of possible arboviral infection for testing to the Division of Microbiology of the North Dakota Department of Health. The NDDoH will provide antibody testing at no charge on suspected human cases (Box 1).

Box 1.
Protocol for WNV Testing by the NDDoH

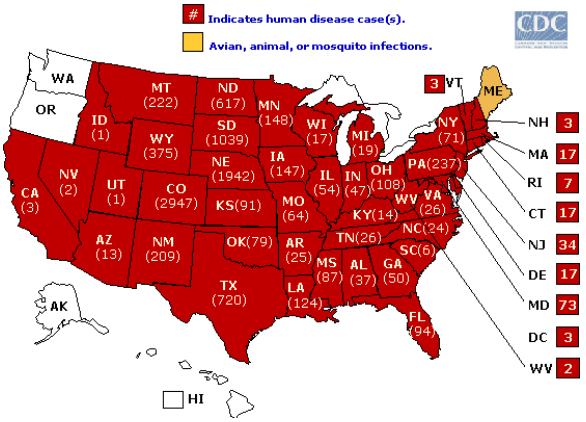
- Testing will be conducted on serum samples. (At least 2 ml of serum is required.)
  - If CSF is drawn, it should be stored frozen.
- Laboratory test request form (SFN 5826) must be completed with the following information:
  - **Patient name and date of birth**
  - **Complete address**
  - **Symptoms and date of onset**
  - **Hospitalization status**
- Arboviral testing will be conducted Monday, Wednesday and Friday.
  - Screening results will be called to providers on all hospitalized patients the following weekday of sample receipt.
  - Confirmatory results will be called on all patients within two working weekdays of sample receipt.

If demand for testing increases, additional days of testing will be added (up to five days a week).

2003 West Nile Virus Summary

During 2003, North Dakota was part of a large outbreak in the Midwest and western United States (Colorado, Nebraska, South Dakota, Texas, Wyoming, Montana and New Mexico). Eighty-two percent (8,071) of the 9,862 reported human cases in 2003 were reported from these eight states, as well as 63 percent (165) of the 264 reported deaths. A summary of the national WNV statistics is available at www.cdc.gov/ncidod/dvbid/westnile/surv&controlCaseCount03_detailed.htm.

2003 West Nile Virus Activity in the United States



(reported as of May 21, 2004)

These figures represent final numbers for 2003

Click here for larger view

In North Dakota, the 2003 West Nile virus surveillance program was initiated in mid-May and concluded in November. The Division of Microbiology conducted WNV testing on 3,209 human samples. In 2003, 617 WNV human cases from 50 counties were reported (Figure 1). In addition to West Nile testing, 1,000 human specimens also were tested for western equine encephalitis, St. Louis encephalitis, eastern equine encephalitis and LaCrosse virus. All were negative.

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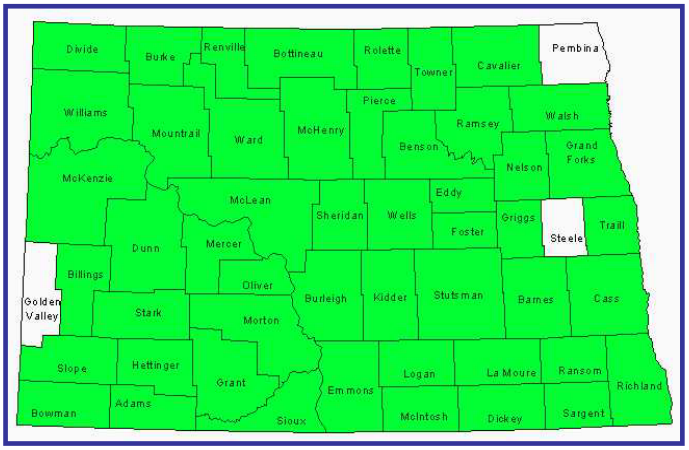
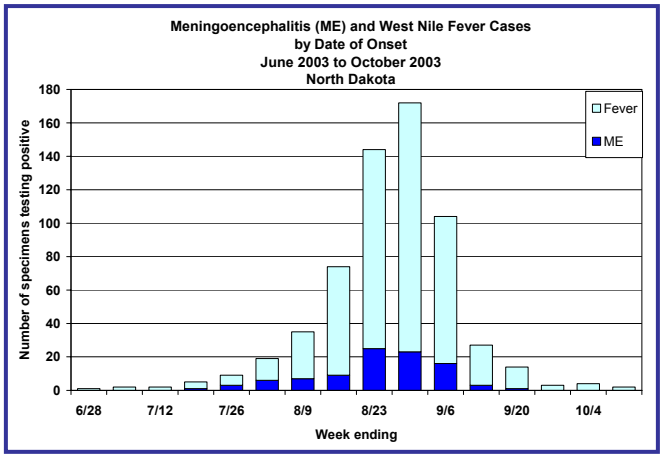
Figure 1. WNV-Positive Human Cases by County* of Residence, North Dakota, 2003



(*Counties with WNV cases in green)

Of the 617 cases reported, all have been followed-up by NDDoH field epidemiologists. Of these 617 cases, 94 (15.2%) met the case definition of West Nile neurological disease, with the remainder (523 cases or 84.8%) classified as West Nile fever. Five of the 94 neurological cases were fatal. The peak of illness onset occurred the week ending Aug. 30, 2003 (Figure 2).

Figure 2. Meningoencephalitis (ME) and West Nile Fever Cases by Date of Onset, June 2003 to October 2003, North Dakota

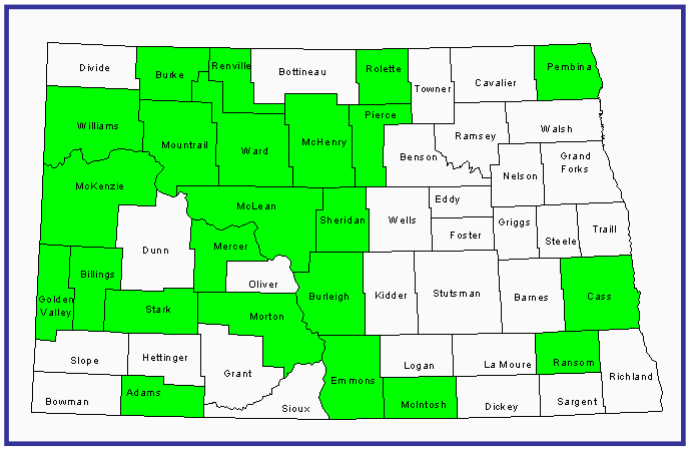


The symptoms most commonly reported by the WNV cases were fatigue (83.6%), headache (82.8%), muscle pain and weakness (77.3%), fever (73.4%) and joint pain (60.1%). Additional symptoms included rash, stiff neck, diarrhea, confusion, conjunctivitis, eye pain, nightmares, blurred vision, chills and skin sensitivity.

In 2002, 23 WNV cases associated with blood transfusions were identified in the United States.[1] As a result, the Food and Drug Administration, in conjunction with blood collection agencies, instituted a blood donor screening protocol for asymptomatic WNV infection. Between June 2003 and December 2003, about 6 million units were screened and at least 818 viremic blood donations were removed from the blood supply.[2] In North Dakota, 50 asymptomatic blood donors were identified with evidence of WNV antibody and three had evidence of West Nile fever. However, it is unknown whether any WNV infections resulted from these donations.

The North Dakota State University Veterinary Diagnostic Laboratory (VDL) tested 169 horses for WNV infection. Of the 169 samples submitted, 41 horses tested positive for WNV. Cases were reported from 23 counties, primarily from the western part of the state (Figure 3).

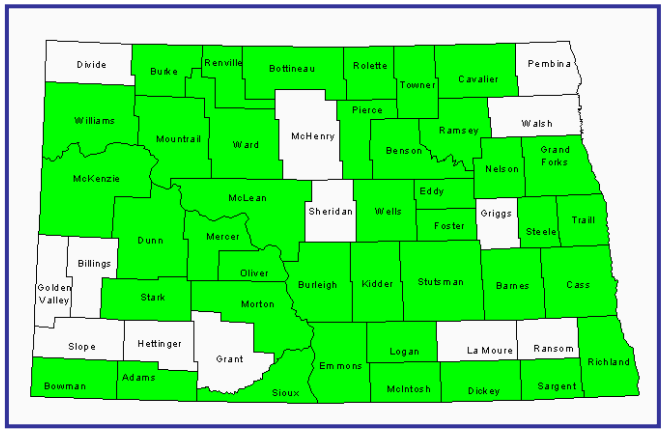
Figure 3. WNV-Positive Equine Cases by County* of Submission, North Dakota, 2003



(*Counties with WNV cases in green)

In addition, 823 birds were collected and sent either to the VDL or the United States Geographical Survey National Wildlife Health Center in Madison, Wisc. for WNV testing. One hundred and sixty-eight birds belonging to more than 25 different species were positive for WNV (Table 1). Birds were submitted for WNV testing from 50 of North Dakota's 53 counties. WNV infected birds were identified in 40 counties (Figure 4).

Figure 4. WNV-Positive Avian Cases by County* of Submission, North Dakota, 2003



(*Counties with WNV cases in green)

In 2003, statewide mosquito monitoring using New Jersey mosquito traps was expanded from 53 to 87 trapping sites. Female *Culex tarsalis* counts peaked the last week of July. Counts dropped off slightly but remained at similar levels until the end of August. Live trapping of mosquitoes was established at nine separate sites throughout the state and

was conducted weekly from July 1 through Sept. 18, 2003. Testing of 96 mosquito pools resulted in 11 pools with WNV-antibody positive results from five counties. County-specific data is listed in Table 2.

Table 1. WNV-Positive Bird Species, North Dakota, 2003

North Dakota Bird Species	# WNV-Positive
American Robin	13
American White Pelican	5
Black Capped Chick	1
Blackbird	6
Blue Bird	1
Blue Jay	15
Bobolink	4
Canada Goose	3
Cedar Waxwing	4
Chickadee	8
Crow	51
Eastern Bluebird	2
Finch	8
Goldfinch	2
Grackle	4
Great Horned Owl	1
Hawk	2
Kingbird	1
Magpie	1
Merlin	1
Mourning Dove	2
Owl	1
Ring-billed Gull	3
Sharp Skinned Hawk	2
Snowy Owl	4
Sparrow	14
Swallow	2
Unknown	2
Wren	2
Yellow Finch	3

Table 2. Number of WNV Cases Per County, North Dakota, 2003

County	Human	Horse	Bird	Mosquito Pools
Adams	7	1	1	
Barnes	4		1	5
Benson	3		1	
Billings	1	1		
Bottineau	5		4	
Bowman	11		1	
Burke	5	1	3	

Table 2. continued

County	Human	Horse	Bird	Mosquito Pools
Burleigh	98	5	21	1
Cass	32	2	12	
Cavalier	1		4	
Dickey	18		1	
Divide	1			
Dunn	13		1	
Eddy	2		2	
Emmons	7	3	2	
Foster	6		3	
Golden Valley		1		
Grand Forks	2		10	2
Grant	7			
Griggs	3			
Hettinger	3			
Kidder	3		1	
LaMoure	26			
Logan	4		3	
McHenry	18	1		
McIntosh	4	1	1	
McKenzie	10	1	1	
McLean	28	1	8	
Mercer	17	1	3	
Morton	48	2	7	
Mountrail	6	2	3	
Nelson	2		2	
Oliver	7		1	
Pembina		1		
Pierce	2	1	6	
Ramsey	12		8	
Ransom	11	1		
Renville	7	1	2	
Richland	11		1	
Rolette	3	3	2	
Sargent	14		3	
Sheridan	6	1		
Sioux	6		1	
Slope	2			
Stark	22	3	6	
Steele			1	
Stutsman	30		13	1
Towner	2		1	
Traill	2		4	
Walsh	7			
Ward	44	4	16	
Wells	5		3	
Williams	29	3	4	2

2002 West Nile Virus Summary

In 2002, the Division of Microbiology tested 371 patients for arboviral disease and identified 17 WNV-positive samples. All specimens were negative for eastern equine encephalitis, western equine encephalitis, LaCrosse encephalitis, California serogroup encephalitis and St. Louis encephalitis.

Seven hundred and sixty-five equine serum samples were sent to the VDL for testing. The VDL reported 569 WNV-positive equine cases. Cases were reported in every county except Divide.

Three hundred and twenty-one dead birds collected from 40 counties were tested for WNV by the United States Geological Services Wildlife Laboratory in Madison, Wisconsin. Sixty-five birds belonging to 12 different species were positive for WNV. WNV-positive birds were identified in 22 counties.

Mosquito trapping was conducted at 36 sites with a total of 60 New Jersey light traps. Mosquitoes were collected from June 3 through Sept. 19, 2002. Female *Culex tarsalis* counts peaked around the beginning of August and remained at similar levels until the end of August. Seventy-eight *Culex tarsalis* mosquito pools were tested for WNV at the Division of Microbiology. One mosquito pool from Grand Forks County was found to be WNV-positive. This pool was collected in July near the site of the first horse identified with WNV infection.

The Division of Disease Control would like to thank the following participants for their participation in the WNV surveillance program:

North Dakota Department of Health
NDDoH Division of Microbiology
NDSU Veterinary Diagnostic Laboratory
Local Public Health Units
North Dakota Board of Animal Health
North Dakota City and County Vector Control Agencies
Volunteer Mosquito Trap Operators
North Dakota Environmental Health Practitioners
North Dakota County Extension Agents
Indian Health Services
USDA Wildlife Services
Local Veterinarians
North Dakota Game and Fish Department
U.S. Fish and Wildlife Services
North Dakota Zoo Personnel
North Dakota City and County Auditors
North Dakota Parks and Recreation Department
Tribal Health
North Dakota Healthcare Professionals
North Dakota Air Force Bases
Department of Emergency Management
Emergency Preparedness and Response Coordinators
NDSU Extension Veterinarian and Staff
North Dakota Bird Watchers Clubs
Theodore Roosevelt National Park
North Dakota Colleges and Universities
Army Corps of Engineers
Turtle Mountain Community College
Highway Patrol, Local Police Units and Sheriff's Departments

The following educational materials are available free of charge and can be ordered by calling 800.472.2180.

Tri-fold brochure

11 x 17 inch poster

Tri-fold 24 x 30 inch display board

To reserve this display board for use at health fairs, county fairs, park events, etc., visit www.ndwnv.com/DisplayRequestForm.htm and complete the reservation form.

Additional information about WNV is available on the NDDoH WNV website at **www.ndwnv.com**

References:

1. Transmission of West Nile Virus through Blood Transfusion in the United States in 2002, NEJM 2003;349(13):1236-1245.
2. CDC. Update: West Nile Virus Screening of Blood Donations and Transfusion-Associated Transmission - United States, 2003, MMWR 2004;53(13):281-284.

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Summary of Selected Reportable Conditions					
North Dakota, 2003-2004					
Reportable Condition	**March - April 2004***	**January-April 2004***		**March - April 2003**	**January-April 2003**
Campylobacteriosis	19	26		13	16
Chlamydia	403	694		302	529
Cryptosporidiosis	0	0		3	3
E. coli, shiga toxin positive (non-O157)	0	3		0	1
E. coli O157:H7	1	2		0	1
Enterococcus, Vancomycin-resistant (VRE)	1	4		1	6
Giardiasis	9	1		6	18
Gonorrhea	28	53		19	26
Haemophilus influenzae (invasive)	2	2		0	1
Hepatitis A	1	1		0	0
Hepatitis B	0	1		0	0
HIV/AIDS	1	5		3	7
Legionellosis	1	1		0	1
Lyme Disease	0	0		0	0
Malaria	2	2		0	0
Meningitis, bacterial[1] (non meningococcal)	4	4		1	2
Meningococcal disease	0	0		0	0
Pertussis	1	5		1	2
Q fever	0	0		1	1
Rabies (animal)	11	21		7	19
Salmonellosis	5	13		8	14
Shigellosis	0	1		0	3
Staphylococcus aureus, Methicillin-resistant (MRSA)	186	439		204	432
Streptococcal disease, Group A[2] (invasive)	3	6		4	9
Streptococcal disease, Group B[2] (infant < 3 months of age)	0	0		0	2
Streptococcal disease, Group B[2] (invasive[3])	9	15		0	6
Streptococcal disease, other[2] (invasive)	1	1		1	1
Streptococcal pneumoniae[2], (invasive, children < 5 years of age)	0	0		0	2
Streptococcal pneumoniae[2] (invasive[4])	12	24		13	25
Streptococcus pneumoniae[2], drug resistant	0	0		0	3
Tuberculosis	3	3		0	0
West Nile Virus Infection	0	0		0	0

*Provisional data

[1] Meningitis caused by *Staphylococcus aureus* and *Streptococcus pneumoniae.*

[2] Includes invasive infections caused by streptococcal disease not including those classified as meningitis.

[3] Includes invasive infections of streptococcal, Group B, disease in persons $\geq$ 3 months of age.

[4] Includes invasive infections caused by *Streptococcus pneumoniae* in persons $\geq$ 5 years of age.